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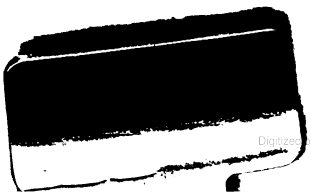

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RURAL ECONOMY;

A Treasury of Information

ON THE

HORSE, PONY, MULE, ASS, COW-KEEPING, SHEEP, PIGS, GOAT, HONEY-BEE, POULTRY, ETC.

BY

MARTIN DOYLE,

AUTHOR OF

"SMALL FARMS," "THINGS WORTH KNOWING," ETC. ETC.

A New Edition.

LONDON:
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1860.

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PREFATORY REMARKS.

THE matter of the following pages appeared in detached articles in a popular periodical. Most of them were contributed by me; and those which were not have been now carefully revised, and partly re-written.

MARTIN DOYLE.

April, 1857.

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THE HONEY-BEE.

CHAPTER X.

Bees brought to England from Flanders—General description of the bee—Reaumur's account of bees—Anecdote of two queen bees—Description of the sting—Further remarks on the natural history of the bee—Wonderful instincts and contrivances of bees—Advantages of keeping them—English and foreign treatment of them—Laying and swarming—Ventilation of the hives—On the union of swarms and hives.

THE natural history of this wonderful creature is extremely curious and interesting; but there is little space here for more than a very brief sketch of it, as the practical part of the subject is more important to the reader.

The race of bees which we possess came originally from Flanders, and is considered the best, from its remarkable activity, industry, and gentleness of character, —though it can sting when provoked, having a lance for the purpose, which is a gift to it from the Creator that has been denied to some tribes of the same general family. The Australian bees, for instance, are so defenceless in being without the sting, that the native savages catch them, and suck the honey out of their bodies with impunity.

The honey produced by the labours of the bee is mentioned as one of the chief attractions of the land of promise to the wandering Israelites. The land to which they were journeying was to be "a land flowing with milk and honey:" honey is frequently referred to by the sacred writers as very desirable food.

The ancient philosophers were, however, ignorant of

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matters respecting the true nature of the bee in some particulars—such as the sex of the sovereign, and also of the sexual distinctions of her subjects—the workers and the drones. They judged that the monarch must be of the masculine gender, and that the great body of workers were so too. They supposed that there were two kings in each hive, concerning which they held very whimsical opinions.

But a more correct knowledge respecting bees was reserved for modern times. Swammardam, a Dutch physician, was the first who discovered, by dissection, that the sex of the monarch is female, and that the queen-bee lays an immense number of eggs, uniting in herself the two characters of sovereign and mother of her people.

Reaumur's Account of Bees.

Reaumur, the French naturalist, made interesting experiments and discoveries in the natural history of bees also; but Huber, who was a native of Geneva, and died in 1831, has written the most clear and satisfactory account of them, as he devoted many years of his life, both before and after he lost his sight, in an accurate study of all their instincts and habits.

The three ranks of bees pass through the successive stages of *egg*, *larva*, and *nymph*; but the future queen, while in the larva (or grub) state, is coiled up in her cradle-cells (two or three being thrown into one for her accommodation) in a position different from that of the other bees, and which tends to promote the greater length of her more tapering body.

The bee larva is a white worm without feet, and ringed all round. The larvæ issue on the third day from the egg state, and are almost motionless; the nourishment given to them by their nurses is a sort of jelly, consisting of honey and the pollen of flowers; and they live on this liquid until they go out to obtain food.

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The embryo queen is fed by her attendants with a richer jelly than that which the ordinary grubs receive. During six days she is nourished in a warm temperature; on the seventh, she becomes a *nymph*, and no longer requires food from her watchful nurses, who then close up the opening of the cell, in order, as is conjectured, to allow a free passage to the workers along the range of the royal apartments, which when open had obstructed their labours, or perhaps to cause greater warmth for the development of more vital power in the royal frame.

Be this as it may, a curtain of wax is formed over the nursery-door, and the inmate sets to spinning out of her own body what is termed the *cocoon*, which is a fine net-work for the lining of her cradle.

On the sixteenth day of her existence she tears to pieces this net-work, and with her teeth makes a little opening in the centre of the waxen partition, through which she puts out her head; and, after labouring during about three hours to enlarge the orifice, she comes forth a full-grown queen, and is immediately surrounded by her delighted subjects, who brush her wings, and relieve her from any impurities of the cradle. Her sovereignty is at once acknowledged, and her influence is without limit.

As the appearance of the queen should be at once recognized by the bee-keeper, it must be now described. Her body is longer, larger, and more pointed than that of the others, and her wings are much shorter than theirs, hardly reaching beyond her middle, whereas those of the others cover the entire body; her belly and legs are of deep golden colour, and the latter are not furnished with the little brushes which those of the workers have to help them in collecting the floury matter which they require for making honey.

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Anecdote of two Queen Bees.

The queen bears no rival authority. If there should be a second queen, she is either sent forth with an attendant swarm of colonists, or put to death by the other bees.

Huber gives an account of a duel between two queens, who, issuing from their nurseries in the same hive, rushed into deadly conflict, catching each other with the teeth. As if they dreaded the fatal consequences to themselves, which would follow from unsheathing their darts, they had the prudence to separate at the height of their fury and fly away. But the other bees compelled them to decide the point of sovereignty on the spot, and then forced them to the contest again. This was done repeatedly, after intervals of breathing time, until the stronger of the two, seizing the other by the wing, stabbed her to death.

Description of the Sting.

The lance, or dagger, which all but the drones possess, is of exquisite workmanship. This is the description of it, seen through the microscope: "Upon examining the edge of a very keen razor through the microscope, this appears as broad as the back of a pretty thick knife, rough, uneven, full of notches and furrows, and, so far from anything like sharpness, that an instrument as blunt as this seems to be, would not serve even to cleave wood; an exceedingly small needle being also examined, the point thereof appeared about a quarter of an inch in breadth, and not round nor flat, but irregular and uneven, and the surface, though extremely bright and smooth to the naked eye, seemed full of ruggedness, holes, and scratches,—in short, it resembled an iron bar out of a smith's forge; but the sting of a bee, viewed through the same instrument, showed a polish most amazingly beautiful, without the least flaw, blemish, or

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irregularity; and indeed with a point too fine to be discovered. Yet this is only the sheath or case of instruments much more exquisite contained therein."

Further Remarks on the Natural History of the Bee.

With respect to the bees generally, the workers become nymphs on the fifth day, but the drones indulge in the inactive state of larvæ one day longer. All the bees spin the cocoon when in the nymph state, and after some days, as in the case of the queen, become perfect bees.

The queen lays an amazing number of eggs in the course of the season, from March to May. She will deposit in the cells from twelve thousand to twenty thousand; and there is another laying from August to October: she lays from one hundred to two hundred daily, until she has produced her thousands. The occupations of rearing the young, forming cells, providing materials for the wax and honey, working them up, and storing provisions, devolve upon the workers, of which there are, on an average, sixteen thousand in each hive.

Scarcely has the queen laid the germs of her new family in their birth-places, when the workers visit them, and become their nurses, provide for their wants, and give them food. They watch day and night for the public good, and would die in defence of their beloved sovereign.

The drones constitute about a tenth part of the population of a hive: they are distinguished from the workers by their greater corpulence and shortness of body. They are certainly idle and lazy, but they fulfil the intention for which they were created. They are probably agents for fecundating the eggs when deposited in the cells.

It would be unjust to condemn them for not collecting honey when they are not provided with the organs for

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doing so, as the workers are; their teeth are too little and short for breaking off the capsules, their mouths are not well formed for sucking the sweets of flowers; and their legs have not those brushes or powder-puffs which enable the others to bring home the farina wanted for making wax. During the summer they find food for themselves, and pass their time in lounging from flower to flower, and they are not found in the hive during the winter. By an extraordinary instinct, they are massacred without pity by the females before this period, in order to save the winter stock of honey, until they have departed voluntarily to some nook where they may rest until wanted in the next spring. These poor things have no weapons of defence.

Wonderful Instincts and Contrivances of Bees.

The contrivances of bees in the construction of their combs is amongst the most wonderful works of God, as regards insect creation. "The form of the comb is in every country the same, the proportions accurately alike, the size the same, to the fraction of a line: go where you will, and the form is proved to be that which the most refined analysis has enabled mathematicians to discover, as of all others the best adapted for the purpose of saving room, work, and materials. This discovery was only made about a century ago; nay, the instrument that enabled us to find it out was unknown for half a century before that application of its powers. And yet the bee has been for thousands of years, in all countries, unerringly working according to a fixed rule, which no one had discovered until the eighteenth century."

We may instance among other surprising illustrations of the ingenuity of these wonderful creatures, that they lay the foundations of their cities at the top of the hive and build downwards. They have straight passages or lanes across their different dwelling-places, wide enough

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for two bees to pass, and in everything show the hand of the Almighty Architect.

Advantages of Keeping Bees.

It is strange, that though the expense of establishing stocks of bees, where there is a garden, is so trivial, and the possible gain so great, few people take the trouble of keeping them. Country cottagers too generally neglect to take advantage even of an adjoining common or lonely garden, which specially invite to bee-keeping. Where cottage gardens are very small and crowded, and *multitudes* of children swarm, it is certainly difficult, if not dangerous, to introduce tens of thousands of bees, with their formidable stings; but in numberless instances where bee-husbandry is neglected, it might be pursued with some profit.

No farmer, nor even humble cottager, who has a patch of garden, and lives near commons, heath-covered hills, or woods, should be without hives, as the great supply of bees' food is obtained by their own exertions. It is not the rarest and most beautiful flowers which afford the best honey, but those which abound in the open fields as well as in the garden: the flowers of mountain heath, clover, trefoil, beans, vetches, wild thyme, turnips and cabbages, privet, elder, bramble, rue, and, above all, the blossoms of the common furze, are among the best materials for honey. The cost of food is scarcely anything, and the return may be considered clear gain.

The trouble of rearing bees, compared with the pleasure or the profit, is nothing. Enormous sums are annually paid in Great Britain and Ireland for bees'-wax imported from foreign countries; why should we not produce more of it at home?

It is to be lamented that so few persons keep bees, an occupation from which so much actual gain may be derived, and so many useful lessons of industry and domestic economy learned.

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How beneficial would be the result to any family, if the keeping of bees and the example of their wonderful habits, should lead the father of that family from low and sensual pursuits, to the simple and natural pleasures associated with bee husbandry and the cultivation of the garden.

In addition to the positive profit and pleasure which would arise from bee-keeping on a more extended scale, there is an indirect advantage which must not be overlooked, namely, the increased productiveness of gardens and orchards; for our Creator appears to have designed the honey not so much for the use of man as to attract the bees to the blossoms, that they may carry the pollen or dust from flower to flower, and render them fertile. It is a well-known fact, that the fructification of flowering plants is accomplished by the dust from the pistils of what are called the male blossoms being deposited in the interior of the female flowers; and thus orchards have been known to produce double the crop after bees were kept there than ever they did before: hence it has been well said, "If there were no bees there would be no apples."

The compiler of this article on bee-keeping, as it first appeared, and which I am revising and remodelling, presses the expediency of never killing bees, and also of preventing their swarming, as the best features of the modern method of bee-keeping. I give his views on the subject, and the reader may form his own judgment respecting them.

English and Foreign Treatment of them.

The usual method of keeping bees in England is that of annual renewal and destruction, a practice to be condemned, not only on the ground of cruelty, but also from the serious loss thereby occasioned. In every other country of Europe the practice is different: bee-keepers never destroy their bees, but take away a portion of their

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produce, and leave them the remainder for winter sustenance. Thus, some place one hive above another, and in the autumn remove the upper one: others turn out their hives and cut out as much comb and honey as they think the bees can well spare, and by these means they obtain from 20lb. to 40lb. of honey from each hive, and still keep up their stock of bees for future seasons. This method, imperfect as it is, is far superior to that adopted by our country people, of smothering the bees with brimstone.

Let us suppose a bee-master in Germany to possess twenty stocks of bees—and many have from 150 to 200—and he takes 30lb. of honey from each; he has 600lb., and *still* retains his twenty stocks; whereas, by the English method of choosing annually the heaviest and lightest stocks for destruction, supposing ten hives are taken, and each produces 30lb., we have but 300lb. of honey, and only half the stock with which to commence the ensuing year.

But the foreign method, though possessing such advantages, does not equal what may be done by the better management about to be explained.

Laying and Swarming.

The queen bee lays from 10,000 to 30,000 eggs in the year. In a stock containing 3,000 bees, almost all of them in ordinary years will be busy in nursing the grubs, for they are such good mothers, that they think it their first duty to feed their young; gathering honey is their second. A swarm goes off: you have two queens, each with 3,000 bees, busy in rearing the eggs which the two queens lay all the summer. They have no spare time to gather honey, and so in a bad year a stock with plenty of inhabitants will be often almost empty of honey when you take it up in the autumn, and sometimes these bees die even in the summer if not fed. Now if you prevent swarming by giving them plenty of room, 3,000 bees, which

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were nurses before to the grubs of one queen, will be sufficient to do a great deal more of nursing work.

The original hive has only one queen, and one queen cannot lay eggs enough to require so many nurses, though two may. The other 3,000 bees prevented from swarming, will store honey for you in the spare room you may give them.

In order to obtain this, if you have your bees in straw hives, the following is the method:—Procure two boards, an inch and a half or two inches thick, and of a size a little larger than the breadth of your hives; let there be a piece cut out of the front, in a sloping direction, and another piece similarly on the right and left side of each, to answer the double purpose of doorway and drain, to allow the moisture from the hives to flow away more readily. The side entrances must be made to fit exactly, when the boards are placed together. Before swarming time, in May, a well-stocked hive of last year is to be placed on one board, an empty hive on the other, a small piece of wood being placed over that part of the two entrances which is between the two hives. Then stop up the doorway of the full hive, so that the bees may have no way of egress, except through that which is empty; and if possible, shift the new entrance along the stool on which you have placed your hives, until it comes opposite the part where the old entrance was; and, if this be sprinkled with a little honey or syrup, the bees will be soon accustomed to the change. Here, then, you have given your bees room, and instead of swarming, they will soon commence their work of building and storing in their new abode, while the queen, with the nurses, is occupied in rearing a new brood, shortly to come forth in strength, to assist in the common work. When the hive is full it should be removed, lest the bees, for want of room, should swarm off, or lose many days' work, by hanging out in a cluster at the entrance, as they are often seen to do previously to swarming.

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The removal may be effected in this manner: in the middle of a fine day, when most of the bees will be out gathering food, cut off the communication between the two hives, by slipping a piece of tin between the side entrances. Shut up the open entrance, and push the hives along the stool, so that the doorway may be brought into the best position. If a great disturbance shortly take place at the mouth of one hive, it is a sign that the queen is in the other which you wish to remove, in which case you must take away the tin which separates them, and wait until another day. If, on the contrary, the bees go on quietly working, you may be sure that the queen is in the right hive, and that all is well. They must then be left until their labours cease in the evening, when, a little before dark, open the entrance, and the prisoners, alarmed at their long separation from their queen, will speedily find their way into the other hive to rejoin her. You may then remove the full hive, and placing an empty one in its place, take out the separating slide, which will leave it ready for operations on the morrow.

Here, then, you have a full hive, perhaps early in June, and that without destroying a single bee, before those on the old plan have commenced their honey gatherings, and at a time when the produce may be disposed of at a higher price than when the honey all comes to market in the autumn. But there is another thing connected with the anti-swarming system which is of the greatest importance in bee management — that is ventilation.

The queen bee will not lay her eggs in a temperature lower than eighty degrees, as this degree of heat appears to be necessary for hatching the young brood; therefore, if the new hive be kept cooler than this, she will remain in the old hive to raise her progeny, and there also the workers will deposit the pollen from the anthers of flowers, which forms the bee-bread, or food of the young offspring; while in the other hive nothing will be placed but the finest wax and honey.

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Ventilation of the Hives.

To ventilate the hive, have fixed in the top a piece of zinc, as large as a crown-piece, punched full of small holes; this must be covered until the bees have commenced their combs, then the covering must be removed. The bees will endeavour to fill up the holes with *propolis*, a gummy substance, which they collect from the bark of trees, on which account you must daily keep the holes open by pricking them through with a piece of wire; you will thus ensure a regular and constant current of fresh air through the hive, entering at the doorway and going out at the top, keeping the hive cool, and enabling the bees to perform their work much more quickly and better than they are able to do without ventilation, while the result to yourself will be, that you will have the purest virgin wax and honey.

On the Union of Swarms and Stocks.

But the question is frequently asked by the defenders of the old system of bee-management, "If we prevent their swarming, by giving the bees room, how are we to keep up our stock?" To this we reply, "Keep a few stocks from which to obtain fresh swarms, but never take more than one swarm from any hive during the season." If a cast should come forth, the readiest way of returning it to the parent stock is to take the bees when they are quietly hived, and suddenly dash them into a large tub or pan of water, placed just before the hive from which they came; then put a board sloping upwards from the tub to the mouth of the hive, take out the bees with a skimmer, lay them on the board, and as they dry in the sun, they will ascend to their old habitation, apparently nothing the worse for this rough treatment. This is a plan we have frequently followed, and always with perfect

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success, and have generally been able to make the queen a prisoner in her upward march with her draggle-tailed guards to her former habitation.

There will be no difficulty in recognizing the queen, from her greater size and more taper body; but even if she be not secured, no inconvenience follows, for she and her subjects will contrive to reunite, or another sovereign will be found or provided to reign in her stead.

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DIRECTIONS TO BEE-KEEPERS.

CHAPTER XI.

Operations in January:—Hives and boxes—To carry a hive. March:—Management of the hives—Feeding. April:—Activity of bees—Preparations for swarms. May:—Swarming—Union of casts. June:—Keeping a register—Uniting stocks—Feeding. July:—Management of black combs—Driving. August:—Changing bees from one feeding place to another. September:—Examination of hives—Feeding—Fumigation—Directions for extracting the honey and wax. October:—Feeding and preserving from dampness—Housing in winter.

JANUARY.

DURING the first month of the year, and in all the winter months, bees require very little attention; indeed nothing more is necessary than to keep them dry, and in a position which cannot be affected by gleams of sunshine.

Hives and Boxes.

Hives and boxes may now be made ready for the ensuing season. For several reasons, we are inclined to recommend straw hives in preference to boxes for bee-management: they are more easily procured, they are cheaper, and if properly protected on the outside, have less tendency to contract damp, which is so fatal to bees. Besides, they have a pretty rustic appearance about them, which boxes, however ornamental, are deficient in; and there is nothing that cannot be accomplished with them, if they rest upon bottom boards of the kind we have described, as easily as with boxes.

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FEBRUARY.

If your hives have been placed in winter-quarters, and the weather at the end of the month prove mild and open, remove them to their summer stands. If, on the contrary, it be unfavourable, you had better keep them sheltered as you have done through the winter. Perhaps the safest guide, as to the time when bees may be allowed to go abroad, is when the primrose and other early spring flowers put forth their blossoms, as this time varies in different situations, according as we approach the northern or southern portions of the kingdom.

Before settling the hives for the summer, weigh them, and note down the weights in a book; you will see by this what quantity of honey has been consumed through the winter, and also be able to tell what feeding the bees will require if the spring be backward.

We do not, however, advise feeding yet, for—until all probability of frost and snow be past—it would be injurious to excite the bees, of whom many would fly abroad, and prematurely perish; thus diminishing the heat of the hive (maintained by the number of inmates), which should be preserved as much as possible, in order to facilitate the hatching of the young brood, which will soon begin to make its appearance.

Keep the entrance to the hive nearly closed, let it be only wide enough for one bee to pass at a time.

This is the best month in the year for purchasing stocks. The bees have lived through the winter, so that you do not run the risk of losing them, as you would have done by buying them in the autumn. You may judge if a stock be a good one, and in a healthy prosperous condition, by observing, on a fine day, whether many or few bees enter the hive with little golden-looking pellets or balls on their hind legs. This is the farina of flowers, or bee-bread, as it is called, which is now col-

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lected by the bees for the nourishment of the young, and forms their principal labour at this season. If you see as many as twenty or thirty every minute going in so laden, you may judge the stock is prospering, and regulate your purchase accordingly. If they do not come out in bad weather, it may be assumed that they have a good store of provision within.

Hives should not be generally removed later than the end of this month, as the bees do not readily take to a new situation when the spring is more advanced.

To Carry a Hive.

Let it be placed on a cloth, the ends of which must be carefully tied over the top; if it is to be taken to a distance, the hive so tied up may be swung on a pole, fastened across a cart from side to side; this prevents the jolting to which it might otherwise be subject, which would disturb the bees, and probably shake down the comb. When arrived at its destination, let the hive be placed on the stand, and if any of the bees have fallen out on the cloth, place them near the entrance, and they will soon find their way in.

MARCH.

Management of the Hives—Feeding.

As soon as the weather is fine, the hives which stood in the open air during the winter should be examined. Lift them carefully from the stand. Clear away all the dead bees and refuse matters which have collected during the winter. Rub the mouldiness and damp from the floor-board, and let it be well dried. The bottoms of the combs often become mouldy in the winter, especially in light stocks, and it will be a good thing to cut off the lower portions, which may be done with a table-knife,

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and without danger, by turning the hive on one side, in the evening, or early in the morning, or at any time, if you take the precaution of smoking a pipe during the operation. The bees will soon renew the combs, and their health will be improved by the removal of the decayed portions.

At the end of the month, if the weather be warm, let the straw hackles be removed, in which mice often lodge themselves, working their way into the hives and destroying them; but do not leave the hives without some protection; cover them with something that will keep off the rain. Do not enlarge the entrances, unless for a part of the day when the weather is very fine, when they may be opened wide enough for two or three bees to pass together.

Feeding.

Begin to feed the light stocks; a liberal supply of food will be amply repaid by the consequent health and vigour of your bees, and the abundant store they will collect for your future benefit. And do not prematurely encourage the bees to go in search of food, but rather confine them to their homes. Guard against the admission of stranger bees while yours are feeding. Give honey now, if you can, rather than syrup, as it forms a better ingredient than sugar in the jelly which supports the young brood.

The consumption of food in a hive is now perhaps greater than at any period of the year. The queen lays from one hundred to two hundred eggs daily, and the increase of the brood is so prodigious, that it is impossible for any except a well-stored hive to meet the demand for food. Many persons wonder that their bees die in the spring, when they have survived the winter; but we have before shown that the food consumed during the cold weather is comparatively very small to what it is during breeding time. On this ground, then, feed abundantly all the stocks, but especially the light ones.

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Feeding outside the hive, by placing food at the entrance, is a bad method, as stranger bees are attracted, which deprive your bees of a proportion of that which you have provided for them. Feeding at the bottom disturbs the bees, lowers the temperature of the hive when the food is introduced, and thus occasions loss of life: therefore, to obviate these evils, ingenious feeding-pans have been invented for supplying food at the top of the hive.

APRIL.

There will be a great increase of activity in the hive this month. As the spring opens, flowering plants and fruit-trees will be in bloom. On account of this increasing supply of food from abroad, there is the less necessity for feeding; yet it should not be entirely discontinued, particularly if the weather prove wet or cold.

Activity of Bees.

Multitudes of bees will now be seen passing out of the hive, and returning richly laden with honey and farina. There will be great pushing and apparent confusion at the entrance, in consequence of the additional labours of the season; for this reason you must enlarge the mouth of the hive, but not yet to its full size.

It is not uncommon at this season to find a hive which exhibits none of this industry and activity. Bees, few in number, and to all appearance without any object, may occasionally be seen going out and in, or lazily buzzing before the hive. If there is no want of honey, the most probable cause of this inactivity is the death of the queen from some accident during the winter. The bees in such a case gradually forsake the hive and mostly perish, though some few probably become united to other stocks. There seems to be no alternative, as soon as the loss of the queen is discovered, than to endeavour, by removing the hive to a dry place, to preserve the lives of as

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many of the bees as possible, in order to unite them with a late swarm, to which they will prove of considerable benefit.

Preparations for Swarms.

Everything necessary should now be prepared for the establishment of swarms, which may be expected during the next two months, else there may be running hither and thither while the swarm takes wing and is lost through your delayed preparation. Hives, or boxes if you intend to make use of these, must be kept dry and sweet; stands or stools to place them on must be prepared, and a hand-brush, leather gloves, crape, or other covering for the face, placed in readiness.

As bees require water to drink, especially through this and the next month, it is necessary to place some for them, if there is no pond or rivulet near. Cotton says that, in the Isle of Wight, the people have a notion that every bee goes down to the sea to drink once a day. Water is needful for them in the breeding season, and they will drink water with salt in it, and like it better than the freshest brook that runs. It is very curious to see how they will flock by thousands to the drinking-troughs in April, May, and part of June; and then their thirst seems to be quenched all of a sudden, for not one will be seen at them. The reason seems to be that they do not want so much water after the greater part of the young brood is hatched.

Shallow dishes or plates filled with water, and having thin boards (pierced with small holes), floating on it, from which the bees may drink without fear of drowning, are convenient. Small pebbles or moss, placed in the plates with the water, will answer almost as well.

MAY.

The instruction for this month will be to those who keep bees in common hives for the purpose of swarming,

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as well as to those who have adopted the method of preventing swarming in order to procure honey.

Bees usually swarm in the months of May and June, sometimes a little earlier or later. The most valuable swarms are those which come at the end of this, or the beginning of next month. The earlier part of May is often cold and wet, the bees are hindered from honey gathering, and unless fed, would decrease in strength very much, and perhaps eventually perish.

The chief indication of swarming being about to take place is the gathering of the bees at the entrance of the hive, where they cling to each other, and hang in a cluster under the board. This clustering is evidently the natural instinct of the bees, which leads them to assemble together in the same manner as when they are making comb within the hive; and as the hive is now quite full, they are under the necessity of remaining in idleness until the time the queen may be ready to accompany them, to form a new colony. Sometimes they will thus dangle for a fortnight, or even a month before they swarm. That this swarming is an act of necessity, not of choice, is evident from the fact that they often begin to construct their combs under the hive board.

It would be a pity to allow these bees to be thus idle in a fine season, when they are quite willing to work; they will lay up a small store of honey for you if you will provide a way for them. For this purpose, if you have a hole at the top of the hive, take out the bung which closes it, and place upon it an inverted glass or flower-pot, which will contain about eight or ten pounds. A board about an inch and a half thick, with a hole in the centre (for the bees to ascend through) should be laid between the top of the hive and the glass. The glass or pot will be filled in a week or ten days, or a fortnight at farthest, and the bees will not be prevented from swarming one day later than they would have done if they had all been out swinging in idleness. The glass

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or flower-pot can be removed by carefully slipping two thin plates of zinc between it and the board, and then lifting away the upper plate together with the glass to a place of safety: the other plate, which has in the mean time prevented the bees from coming out at the top of the hive, may then be taken off, and a bung placed at the hole; the bees remaining in the pot may be removed in the evening to the hive, after being chloroformed or fumigated.

Clustering is not the only sign of an approaching swarm. The appearance of the drones about the middle of the day, a kind of hum, a shrill piping sound in the hive in the evening, and the restlessness of the bees, are also indications; and generally, when on a fine morning very few bees are at work, while on the day before all was activity and bustle, it is pretty certain that the swarm will rise in the course of the day. But sometimes they swarm without any notice; so it is better to have some one to watch on fine days, from about nine in the morning till three o'clock, that it may be known immediately when a swarm has gone off.

No one need be afraid of bees when they swarm; they appear to be fearful themselves at that time, and are usually quite peaceable. But as all persons have not courage, it is much safer to have gloves on, and the head and neck covered with a hood of gauze, crape, or thin linen; and thus protected, any one may venture to hive bees with impunity. Throwing dust or water among them during their flight is often injurious; and music! from your warming-pan and door-key, or your tongs and shovel, is of no use, and may hinder you from attending to something necessary to be done. If possible, get a person who is accustomed to it, to hive the swarm; but if not, attend to the following directions:—

If the swarm is to be put into a straw hive, let this be new. Lose no time as soon as your swarm is settled on a bough, or they may be off, and you will probably lose them. Spread a table-cloth or a sheet on the ground under the

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swarm. Place the hive-board upon it. Let one person hold the hive turned upside down close under the swarm, while another gives the bough a sudden shake, so as to jerk off the whole mass of bees into the hive, which must then be turned down upon the cloth, the edge being a little raised by a stone or bit of wood, that the bees may not be crushed. If the swarm be hanging upon a small branch, it may be cut off, and let fall into the hive. When on the thick branch of a tree, there will be more difficulty. In this case hold the hive under as before, and sweep the bees into it as carefully as possible with a soft hand-brush. If the queen be swept into the hive, the bees will soon follow. Should it happen that they swarm high up in a tree, these directions must be followed as nearly as possible by persons mounted on ladders.

This swarming is necessary in order to increase or keep up your stocks; but of course it should only be allowed from hives kept on purpose, as the new system is intended to prevent swarming, in order to procure a plentiful supply of honey from the increased population.

Union of Casts.

Never on any account hive a cast with the intention of keeping it by itself through the winter, or for taking up in the autumn; rather return it to the parent hive or unite it to one of the earlier swarms, so as to make a strong stock. Unless the year be unusually favourable, casts never do any good, while the old stock is often so weakened by the loss, as to be almost worthless in the autumn, or for preserving through the winter.

You may unite casts by intoxicating the bees, with the smoke of the fungus called powder-puff, and make them drop from one hive into another, taking care to have but one queen, however numerous the union may be.

If unfavourable weather ensues shortly after the

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swarm is hived, feed the bees; it will strengthen them and prove a gain to you in the end.

The entrance into the hive should now be enlarged to its full size, that the bees may have abundant room in the busy season of honey-gathering. Side-boxes may be opened; they need not be ventilated for two or three days, until the bees have well taken to them and begun to form comb; after this, however, great care must be taken to ventilate well, in order to keep them cool. Give plenty of water, but so that the bees may not drown themselves. Shade the hives from the burning sun, which makes them so hot that the bees can scarcely work, and sometimes melts the combs, causing them to fall down and smother the bees. Feeding old stocks need not be continued unless the weather be unusually unpropitious.

JUNE.

Bees kept in hives or boxes on the improved system must now have additional room given them, in order to prevent swarming (see page 87).

Keeping a Register.

It is a good plan to keep a register, in order to see how long the bees are in filling the hive, and for comparison with future years. The following extracts from our own diary will show the plan:—

1850. HIVE No. 2.
May 22.—Opened right-hand side-box.
,, 26.—Bees commenced work in ditto.
,, 31.—Opened left-hand box. Bees immediately began labour.
June 12.—Took away right-hand box. Weight of honey 12 lb.

A daily register of the weather will also be very useful. Be careful to give room in time, and to take away the

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side-hive as soon as filled, or the bees may swarm. If they do so, return them to the parent stock by the plan recommended at page 86.

Uniting Stocks.

Weak stocks may be strengthened now by having casts joined to them, either by the method given at page 87, or in the following manner:—On the evening of the day the cast is hived, as soon as the bees are all quiet, turn up the hive, and sprinkle the bees with syrup: then suddenly shake them out altogether upon a table; place the hive in which they are to be united above that mass of bees, and support it that none may be crushed; both will very soon become one stock. Late that night, or very early next morning, the hive must be placed where it is to remain. Many bee-keepers adopt this method with success. Casts may be joined together in the same manner, so as to form a strong stock, instead of two or more worthless ones.

Feeding.

People sometimes wonder how it is that their bees die in the summer; this very often happens in hot dry weather, when the flowers afford no honey, and there is no supply for the young brood, and the nurses are obliged to cast out from the hives the grubs, which perish thus by thousands. A little timely feeding at such a season would preserve their lives.

JULY.

Management of Black Combs.

The combs in hives that have stood for several years become black and useless, because the bees never clear out the cells in which the brood has been reared, and the skins which the young bees cast gradually fill up the cells

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until they are too small for breeding in; in consequence, the hives get weaker and weaker; swarming cannot take place, and at last the bees die.

To prevent this fatal end, you may in spring, before breeding-time commences, after fumigating the bees a little, turn up the hive, and cut out half the comb; put the bees in again, and during the summer they will fill up the vacancy, and have room for breeding. Next spring take out the remainder of the old comb in the same way. One stock treated in this manner is said to have been kept for the long period of sixty years. Sometimes, when a stock has not swarmed, it is desirable to remove the bees altogether from the old hive into a new one. This must only be done during the first week in July; if attempted earlier, the new brood not being all hatched, May bee-grubs would be destroyed, and you would have a weak stock. On the other hand, if transferred later, there would not be time for them to make their comb, and lay up winter store. Fumigate or intoxicate the bees at night, and put them while stupified into a new hive, taking care that the queen is among them; place the hive on the stand in the same position the old one occupied, and on the morrow they will commence their labour as a new swarm. If the weather be fine, they will do well; but if they are found to be weak in autumn, take them up and unite them with another stock.

Driving.

Driving bees is sometimes adopted instead of fumigating. The operation is as follows:—Put the new hive upside down in a pail or pan; place the old hive carefully upon it, and tie a cloth round to keep the hives together, to prevent any bees from escaping. Turn the hives up, so that the old one may be at the bottom, the new one above. Tap gently with a stick round and round the old hive until the bees ascend to the new one. As soon as they appear to have gone up, put the new hive on the

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stand in place of the old one. If the queen is in the new hive, the bees left in the old one will soon rejoin her, if the old hive be placed near. This method is best practised in the evening.

Now take side-hives and boxes when they are filled, as directed (page 87). Prevent swarming in July; late swarms never do any good.

AUGUST.

Changing Bees from one feeding-place to another.

On the Continent, and in some parts of our own country, it is usual to take bees to different places, in order that as food fails in one part they may find a supply in another. Cotton says:—"In France they put their hives into a boat, some hundreds together, which floats down the stream by night, and stops by day. The bees go out in the morning, return in the evening, and when they are all back and quiet, on the boat floats. I should like to see this tried on the Thames, for no river has more bee food near its banks,—willows, the best bee food in spring; meadows, clover, beans, and lime-trees, in different places and times, for summer. A handy man who could make his own boxes, though not up to hard work, might, I am pretty sure, gather through the mouths of his many thousand bees enough to fill his own one mouth, though it be somewhat larger. He might float softly down the river, as the flowers go off at one place and come on at another; and any bargeman would be glad, for the small price of one pound of Thames honey, to give him a tow up when he wants to go back. I should like to see it tried!"

In Yorkshire it is a common thing for cottagers who live near the moors to be intrusted with the hives of other persons who have not this advantage. They charge about a shilling for each hive; and during the months of August and September these bees have a good honey-gathering from the heather then in bloom, and are after-

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wards returned to their owners, who reap a good profit from the visit their bees have made.

Whoever has the opportunity will do well to send his bees to the neighbourhood of heaths at this season; for bees do not find their food in corn-fields. This is the great honey-harvest month for you. Let us again urge the merciful recommendation—do not kill your bees,—do not take the honey by suffocating with brimstone. Fumigate with the fungus or other substances as we have recommended, and unite the bees to strong stocks to stand the winter. Thus you get the honey, and yet save your bees. Now contract the entrance of the hives, to guard against mice or other robbers.

SEPTEMBER.

This month is the proper time for carefully inspecting your stocks, to ascertain which will stand the winter, for feeding those which have not sufficient food, and for uniting weak stocks to strong ones, as recommended previously.

By gently striking the hives, you may judge whether they contain many or few bees, from the greater or lesser noise they make in the buzzing which immediately follows. Do not leave any to remain for the winter but such as weigh about 20lb. But recollect that a hive with two thousand bees will be more likely to survive than one with only one thousand, even if the latter have much more honey. On this account it is important to ascertain the number of bees, and to make your standing stocks as strong as possible, to maintain sufficient heat in the hives.

Feeding.

Whatever food is required must be given now, as bees should not on any account be fed in winter. Those who have not the convenience of the feeding-pans for the top of the hive, should provide little hollow troughs made of

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elder, or a split bamboo stopped at the ends. These must be filled with honey or syrup, and then pushed into the mouth of the hive at sunset, the entrance being carefully closed, to prevent other bees from entering. Feeding should not take place in the daytime, as the hive will then be subject to the depredations of wasps and robber-bees, which are attracted by the scent, and not unfrequently devour the whole of the honey. In the morning, a little before sunrise, remove the troughs. Continue this operation nightly until you are sure your bees have sufficient winter provision. Do not be stingy: as we have said before, you will reap the profit of liberality to your bees in the rich return they will make.

Fumigation.

As some persons profess to have a difficulty in procuring the fumigating fungus, we may just say that the substance called German tinder, used by cigar smokers, or tobacco-leaves wrapped in brown paper, will answer almost as well.

If bees be kept exposed to the cold after fumigation, they will surely die; but in a warm room there is no danger of this. If they appear to you to have had an over-dose, and you find many apparently dead on the following morning, they may be recovered by placing them in the sun, or by any gradual application of warmth. After being drowned for twenty-four hours, and dried and warmed in the sun, bees will recover; even the fumes of brimstone do not always kill them. It was by the reviving of some, half-smothered in this manner, that the above more merciful plan was thought of.

If any drones are observed about the mouths of the hives as late in the season as the present month, it is more than probable that some defect exists within; and it would be well to select such stocks for union with others.

Close the entrance of your hives, only leaving room for

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one bee to pass at a time. Protect them from the weather; a good straw hackle may do very well for the winter, but a red pan turned down upon the hive is better.

Directions for extracting the Honey and Wax from the Combs.

Remove your combs into a room where the bees cannot enter, otherwise so many will be attracted by the scent, as to interfere with your operations. Clean the combs carefully from all refuse, then cut them in slices, and lay them on wires or small sticks placed over a pan, that they may drain. The honey which runs in this manner is the best. After all the honey that will flow has come away, wrap the combs in a clean cloth, and squeeze out as much as possible into another pan. This honey will be of an inferior quality to the other. The combs, cloths, and other materials used in the separation, may then be placed near your hives, and the bees will carefully collect all that remains.

Afterwards put the combs into a clean saucepan, with as much soft water as may be necessary to prevent the wax from burning. Place the saucepan over a slow fire, and stir occasionally until the wax is quite melted. Strain through a fine canvas bag into a tub of cold water. You will have to squeeze the bag between two boards to force the wax through; it will fall into the water, and form thin flakes on the surface. Then collect the wax, put it again into the saucepan made quite clean, with a little water, melt it again very carefully over a slow fire as before, and take off the scum as it rises. When sufficiently melted, pour it into wetted saucers or other moulds, and set it by, where it may cool very slowly, or it will be full of cracks.

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OCTOBER.

Feeding, and preserving from Dampness.

This month it will be advisable to ascertain if your stocks have sufficient food for winter; if they have not, still continue to feed them as they require, and the weather permits.

Guard against dampness; it is this more than all else that will destroy your bees. The damp of the weather outside the hive may be kept away by suitable protection, but it is the damp inside, caused by the condensation of the moisture from the breath of the bees, which does the mischief. Just as the wet collects and trickles down the walls or windows of a room in which a number of persons are assembled, so does it form in a hive, and more so in winter when there is but little evaporation.

An equal temperature within and without the hive would best prevent condensation. Do not think, therefore, of keeping your bees warm.

Housing in Winter.

The best place for bees in winter is a dry, cold, and dark room, or outhouse.

Put your bees there the last week of November, and let them sleep quietly till the flowers begin to come out at the end of February. Set their bottom-board slanting, that all the wet may run out at the door; or, still better, hang the hives in a coarse cloth. This will let in the air, and let out the moisture. In the spring you will find the bees kept in this way much stronger, as well as heavier, than any you leave on their summer stands. If you have no such room or outhouse, at least keep the sun away from them, or put them on the north side of your house, if the place is dry.

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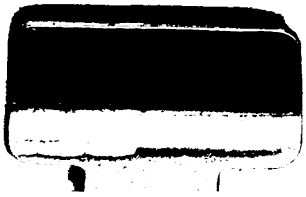

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